

10/563194

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SEQUENCE LISTING

<110> JENSEN, Jens Stougaard  
<110> MADSEN, Lene Heegaard  
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<151> 2004-07-02

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9180

Met	Leu	Asn	Met	Val	Ile	Phe	Leu	Gln	Lys	Met	Tyr	Met
	490				495						500	

cat ttg gag ttg ttc ttt ttg aac tta ttt ctg caa aga atg ctg ttc  
9228

His	Leu	Glu	Leu	Phe	Phe	Leu	Asn	Leu	Phe	Leu	Gln	Arg	Met	Leu	Phe
	505						510					515			

tga aga cag gtg aat tag ttg ctg aat caa agg gcc ttg tag ctt tg  
9275

Arg	Gln	Val	Asn	Leu	Leu	Asn	Gln	Arg	Ala	Leu	Leu	Cys
		520				525						

gtgagtctac atgcccttc tctaacctta ttacaaaacc aattactcac aatttcgaaa  
9335

atttacatg tatatttcaa agctactcag cacaaatgca ttgacctta acttgctttg  
9395

cattgcag t ttg aag aag cac tta ata aga gtg atc ctt gtg atg ctc  
9443

Leu	Lys	Lys	His	Leu	Ile	Arg	Val	Ile	Leu	Val	Met	Leu
				535					540			

ttc gca aac tgg tgg atc cta ggc ttg gag aaa act atc caa ttg att  
9491

Phe Ala Asn Trp Trp Ile Leu Gly Leu Glu Lys Thr Ile Gln Leu Ile  
545 550 555

ctg ttc tca ag gtgggagcaa ttctcactaa aattaatttg aaatgaatta  
9542

Leu Phe Ser Arg  
560

ctatcattta gtcacttgaa tgactttttt tatcagaaca taagcagggt gtgtctagtt  
9602

ttcttttgggt ggggttagga cttaaagtta tcttagtgta aaattttctc attttactaa  
9662

acottaatgc tttattgttg tttgagttgc ag a ttg cac aac tag gga gag ctt  
9716

Leu His Asn Gly Glu Leu  
565

gta caa gag ata atc cac tgc taa gac caa gta tga gat ctt tag ttg  
9764

Val Gln Glu Ile Ile His Cys Asp Gln Val Asp Leu Leu  
570 575 580

ttg ctc tta tga ccc ttt cat cac tta ctg agg att gtg atg atg aat  
9812

Leu Leu Leu Pro Phe His His Leu Leu Arg Ile Val Met Met Asn  
585 590 595

ctt cct acg aaa gtc aaa ctc tca taa att tac tgt ctg tga gat aa  
9859

Leu Pro Thr Lys Val Lys Leu Ser Ile Tyr Cys Leu Asp  
600 605 610

aggttctcca tgcaaatgca tgtttggttat atatatcttg tagtacaact aagcagacaa  
9919

aaagttttgt actttgaatg taaatcgagt cagggtgttt acattttatt actccaatgt  
9979

ttaattgcca aaaccatcaa aaagtccatg gccagacttc ctgtaattat atttagcaaa  
10039

gttgagatt ctaagttcag tttttttata tataggtttc agtatttttt atatatatta  
10099

ttttataaat tttttaactt gttacaatat aaacatattt gcattcatct tcaaattctt  
10159

cagaatcact tctcctacca cagaagctaa tagaagtgtc ttccagaatc aattcttcac  
10219

ccactgtgaa aatctactat gtatcaaagc atgc  
10253



<210> 24  
<211> 621  
<212> PRT  
<213> Lotus japonicus Gifu

<400> 24

Met Lys Leu Lys Thr Gly Leu Leu Leu Phe Phe Ile Leu Leu Leu Gly  
1 5 10 15

His Val Cys Phe His Val Glu Ser Asn Cys Leu Lys Gly Cys Asp Leu  
20 25 30

Ala Leu Ala Ser Tyr Tyr Ile Leu Pro Gly Val Phe Ile Leu Gln Asn  
35 40 45

Ile Thr Thr Phe Met Gln Ser Glu Ile Val Ser Ser Asn Asp Ala Ile  
50 55 60

Thr Ser Tyr Asn Lys Asp Lys Ile Leu Asn Asp Ile Asn Ile Gln Ser  
65 70 75 80

Phe Gln Arg Leu Asn Ile Pro Phe Pro Cys Asp Cys Ile Gly Gly Glu  
85 90 95

Phe Leu Gly His Val Phe Glu Tyr Ser Ala Ser Lys Gly Asp Thr Tyr  
100 105 110

Glu Thr Ile Ala Asn Leu Tyr Tyr Ala Asn Leu Thr Thr Val Asp Leu  
115 120 125

Leu Lys Arg Phe Asn Ser Tyr Asp Pro Lys Asn Ile Pro Val Asn Ala  
130 135 140

Lys Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Val Ser  
145 150 155 160

Lys Asp Tyr Gly Leu Phe Ile Thr Tyr Pro Ile Arg Pro Gly Asp Thr  
165 170 175

Leu Gln Asp Ile Ala Asn Gln Ser Ser Leu Asp Ala Gly Leu Ile Gln  
180 185 190

Ser Phe Asn Pro Ser Val Asn Phe Ser Lys Asp Ser Gly Ile Ala Phe  
195 200 205

Ile Pro Gly Arg Tyr Lys Asn Gly Val Tyr Val Pro Leu Tyr His Arg  
210 215 220

Thr Ala Gly Leu Ala Ser Gly Ala Ala Val Gly Ile Ser Ile Ala Gly  
225 230 235 240

Thr Phe Val Leu Leu Leu Leu Ala Phe Cys Met Tyr Val Arg Tyr Gln  
245 250 255

Lys Lys Glu Glu Glu Lys Ala Lys Leu Pro Thr Asp Ile Ser Met Ala  
260 265 270

Leu Ser Thr Gln Asp Ala Ser Ser Ser Ala Glu Tyr Glu Thr Ser Gly  
275 280 285

Ser Ser Gly Pro Gly Thr Ala Ser Ala Thr Gly Leu Thr Ser Ile Met  
290 295 300

Val Ala Lys Ser Met Glu Phe Ser Tyr Gln Glu Leu Ala Lys Ala Thr  
305 310 315 320

Asn Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe Gly Ala  
325 330 335

Val Tyr Tyr Ala Glu Leu Arg Gly Lys Lys Thr Ala Ile Lys Lys Met  
340 345 350

Asp Val Gln Ala Ser Thr Glu Phe Leu Cys Glu Leu Lys Val Leu Thr  
355 360 365

His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys Val Glu  
370 375 380

Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn Leu Gly  
385 390 395 400

Gln Tyr Leu His Gly Ser Gly Lys Glu Pro Leu Pro Trp Ser Ser Arg  
405 410 415

Val Gln Ile Ala Leu Asp Ala Ala Arg Gly Leu Glu Tyr Ile His Glu

420	425	430
His Thr Val Pro Val Tyr Ile	His Arg Asp Val Lys Ser Ala Asn Ile	
435	440	445
Leu Ile Asp Lys Asn Leu Arg Gly Lys Val Ala Asp Phe Gly Leu Thr		
450	455	460
Lys Leu Ile Glu Val Gly Asn Ser Thr Leu Gln Thr Arg Leu Val Gly		
465	470	475 480
Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp Ile Ser		
485	490	495
Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Phe Glu Leu Ile		
500	505	510
Ser Ala Lys Asn Ala Val Leu Lys Thr Gly Glu Leu Val Ala Glu Ser		
515	520	525
Lys Gly Leu Val Ala Leu Phe Glu Glu Ala Leu Asn Lys Ser Asp Pro		
530	535	540
Cys Asp Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Gly Glu Asn Tyr		
545	550	555 560
Pro Ile Asp Ser Val Leu Lys Ile Ala Gln Leu Gly Arg Ala Cys Thr		
565	570	575
Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val Val Ala		
580	585	590
Leu Met Thr Leu Ser Ser Leu Thr Glu Asp Cys Asp Asp Glu Ser Ser		
595	600	605
Tyr Glu Ser Gln Thr Leu Ile Asn Leu Leu Ser Val Arg		
610	615	620

<210> 25  
 <211> 623  
 <212> PRT  
 <213> Lotus japonicus Gifu  
 <400> 25

Met Lys Leu Lys Thr Gly Leu Leu Leu Phe Phe Ile Leu Leu Leu Gly  
1 5 10 15

His Val Cys Phe His Val Glu Ser Asn Cys Leu Lys Gly Cys Asp Leu  
20 25 30

Ala Leu Ala Ser Tyr Tyr Ile Leu Pro Gly Val Phe Ile Leu Gln Asn  
35 40 45

Ile Thr Thr Phe Met Gln Ser Glu Ile Val Ser Ser Asn Asp Ala Ile  
50 55 60

Thr Ser Tyr Asn Lys Asp Lys Ile Leu Asn Asp Ile Asn Ile Gln Ser  
65 70 75 80

Phe Gln Arg Leu Asn Ile Pro Phe Pro Cys Asp Cys Ile Gly Gly Glu  
85 90 95

Phe Leu Gly His Val Phe Glu Tyr Ser Ala Ser Lys Gly Asp Thr Tyr  
100 105 110

Glu Thr Ile Ala Asn Leu Tyr Tyr Ala Asn Leu Thr Thr Val Asp Leu  
115 120 125

Leu Lys Arg Phe Asn Ser Tyr Asp Pro Lys Asn Ile Pro Val Asn Ala  
130 135 140

Lys Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Val Ser  
145 150 155 160

Lys Asp Tyr Gly Leu Phe Ile Thr Tyr Pro Ile Arg Pro Gly Asp Thr  
165 170 175

Leu Gln Asp Ile Ala Asn Gln Ser Ser Leu Asp Ala Gly Leu Ile Gln  
180 185 190

Ser Phe Asn Pro Ser Val Asn Phe Ser Lys Asp Ser Gly Ile Ala Phe  
195 200 205

Ile Pro Gly Arg Tyr Lys Asn Gly Val Tyr Val Pro Leu Tyr His Arg  
210 215 220

Thr Ala Gly Leu Ala Ser Gly Ala Ala Val Gly Ile Ser Ile Ala Gly  
225 230 235 240

Thr Phe Val Leu Leu Leu Leu Ala Phe Cys Met Tyr Val Arg Tyr Gln  
245 250 255

Lys Lys Glu Glu Glu Lys Ala Lys Leu Pro Thr Asp Ile Ser Met Ala  
260 265 270

Leu Ser Thr Gln Asp Ala Gly Asn Ser Ser Ser Ala Glu Tyr Glu Thr  
275 280 285

Ser Gly Ser Ser Gly Pro Gly Thr Ala Ser Ala Thr Gly Leu Thr Ser  
290 295 300

Ile Met Val Ala Lys Ser Met Glu Phe Ser Tyr Gln Glu Leu Ala Lys  
305 310 315 320

Ala Thr Asn Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe  
325 330 335

Gly Ala Val Tyr Tyr Ala Glu Leu Arg Gly Lys Lys Thr Ala Ile Lys  
340 345 350

Lys Met Asp Val Gln Ala Ser Thr Glu Phe Leu Cys Glu Leu Lys Val  
355 360 365

Leu Thr His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys  
370 375 380

Val Glu Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn  
385 390 395 400

Leu Gly Gln Tyr Leu His Gly Ser Gly Lys Glu Pro Leu Pro Trp Ser  
405 410 415

Ser Arg Val Gln Ile Ala Leu Asp Ala Ala Arg Gly Leu Glu Tyr Ile  
420 425 430

His Glu His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala  
435 440 445

Asn Ile Leu Ile Asp Lys Asn Leu Arg Gly Lys Val Ala Asp Phe Gly

450	455	460
Leu Thr Lys Leu Ile Glu Val Gly Asn Ser Thr Leu Gln Thr Arg Leu		
465	470	475 480
Val Gly Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp		
	485 490	495
Ile Ser Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Phe Glu		
	500 505	510
Leu Ile Ser Ala Lys Asn Ala Val Leu Lys Thr Gly Glu Leu Val Ala		
	515 520	525
Glu Ser Lys Gly Leu Val Ala Leu Phe Glu Glu Ala Leu Asn Lys Ser		
	530 535	540
Asp Pro Cys Asp Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Gly Glu		
545	550 555	560
Asn Tyr Pro Ile Asp Ser Val Leu Lys Ile Ala Gln Leu Gly Arg Ala		
	565 570	575
Cys Thr Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val		
	580 585	590
Val Ala Leu Met Thr Leu Ser Ser Leu Thr Glu Asp Cys Asp Asp Glu		
	595 600	605
Ser Ser Tyr Glu Ser Gln Thr Leu Ile Asn Leu Leu Ser Val Arg		
610	615	620

<210> 26  
 <211> 19  
 <212> DNA  
 <213> Lotus japonicus

<400> 26  
 aatgctcttg atcaggctg  
 19

<210> 27  
 <211> 20  
 <212> DNA  
 <213> Lotus japonicus

<400> 27  
aggagcccaa gtgagtgcta  
20

<210> 28  
<211> 20  
<212> DNA  
<213> Lotus japonicus

<400> 28  
caggaaaaac caccacctgt  
20

<210> 29  
<211> 21  
<212> DNA  
<213> Lotus japonicus

<400> 29  
atggaggcga atacactggt g  
21

<210> 30  
<211> 1853  
<212> DNA  
<213> Lotus filicaulis

<400> 30  
ttttctcttt cctgtttaac tatcatttgt tcccaacttc acaaacatgg ctgtcttctt  
60

tcttacctct ggctctctga gtctttttct tgcactcacg ttgcttttca ctaacatcgc  
120

cgctcgatca gaacagatca gcggcccaga cttttcatgc cctgttgact cacctccttc  
180

ttgtgaaaca tatgtgacat acacagctca gtctccaaat cttctgagcc tgacaaacat  
240

atctgatata ttgatata gtcctttgtc cattgcaaga gccagtaaca tagatgcagg  
300

gaaggacaag ctggttccag gccaaagtct actggtacct gtaacttgcg gttgcgccgg  
360

aaaccactct tctgccaata cctcctacca aatccagaaa ggtgatagct acgactttgt  
420

tgcaaccact ttatatgaga accttacaaa ttggaatata gtacaagctt caaaccagg  
480

ggtaaatcca tatttggtgc cagagcgcgt caaagtcgta ttccctttat tctgcaggtg  
540

cccttcaaag aaccagttga acaaagggat tcagtatctg attacttatg tgtggaagcc  
600

caatgacaat gtttcccttg tgagtgccaa gtttggtgca tccccagcgg acatattgac  
660

tgaaaaccgc tacgggtcaag acttcaactgc tgcaaccaac cttccaatth tgatcccagt  
720

gacacagttg ccaaagctta ctcaaccttc ttcaaattga aggaaaagca gcattcatct  
780

tctggttata cttggtatta ccctgggatg cacgttgcta actgcagttt taaccgggac  
840

cctcgatatat gtatactgcc gcagaaagaa ggctctgaat aggactgctt catcagctga  
900

gactgctgat aaactacttt ctggagtttc aggctatgta agcaagccaa acgtgtatga  
960

aatcgacgag ataattggaag ctacgaagga tttcagcgat gaggcaagg ttgggggaatc  
1020

agtgtacaag gccaacatag aaggctcgggt tgtagcggta aagaaaatca aggaagggtg  
1080

tgccaatgag gaactgaaaa ttctgcagaa ggtaaatcat ggaaatctgg tgaaactaat  
1140

gggtgtctcc tcaggctatg atggaaactg tttcttggtt tatgaatatg ctgaaaatgg  
1200

gtctcttgct gagggtgctg tctccaagtc ttcaggaacc ccaaactccc ttacatggtc  
1260

tcaaaggata agcatagcag tggatgttgc tgtgggtctg caatacatgc atgaacatac  
1320

ctatccaaga ataatacaca gggacatcac aacaagtaat atccttctcg actcgacctt  
1380

caaggccaag atagcaaatt tcgccatggc cagaacttcg accaaccoca tgatgccaaa  
1440

aatcgatgtc ttcgctttcg ggggtgcttct gatagagttg ctcaccggaa ggaaagccat  
1500

gacaaccaag gagaacggcg aggtggttat gctgtggaag gatatgtggg agatctttga  
1560

catagaagag aatagagagg agaggatcag aaaatggatg gatcctaatt tagagagctt  
1620



ttatcatata gataatgctc tcagcttggc atccttagca gtgaattgca cagctgataa  
1680

gtctttgtct cgacctcca tggctgaaat tgttcttagc ctctcctttc tcaactcaaca  
1740

atcatctaac cccacattag agagatcctt gacttcttct gggttagatg tagaagatga  
1800

tgctcatatt gtcacttcca ttacagcacg ttaagcaagg gaaggtaatt cag  
1853

<210> 31

<211> 595

<212> PRT

<213> Lotus filicaulis

<400> 31

Met Ala Val Phe Phe Leu Thr Ser Gly Ser Leu Ser Leu Phe Leu Ala  
1 5 10 15

Leu Thr Leu Leu Phe Thr Asn Ile Ala Ala Arg Ser Glu Gln Ile Ser  
20 25 30

Gly Pro Asp Phe Ser Cys Pro Val Asp Ser Pro Pro Ser Cys Glu Thr  
35 40 45

Tyr Val Thr Tyr Thr Ala Gln Ser Pro Asn Leu Leu Ser Leu Thr Asn  
50 55 60

Ile Ser Asp Ile Phe Asp Ile Ser Pro Leu Ser Ile Ala Arg Ala Ser  
65 70 75 80

Asn Ile Asp Ala Gly Lys Asp Lys Leu Val Pro Gly Gln Val Leu Leu  
85 90 95

Val Pro Val Thr Cys Gly Cys Ala Gly Asn His Ser Ser Ala Asn Thr  
100 105 110

Ser Tyr Gln Ile Gln Lys Gly Asp Ser Tyr Asp Phe Val Ala Thr Thr  
115 120 125

Leu Tyr Glu Asn Leu Thr Asn Trp Asn Ile Val Gln Ala Ser Asn Pro  
130 135 140

Gly Val Asn Pro Tyr Leu Leu Pro Glu Arg Val Lys Val Val Phe Pro

145		150		155		160
Leu Phe Cys Arg Cys Pro Ser Lys Asn Gln Leu Asn Lys Gly Ile Gln						
	165		170		175	
Tyr Leu Ile Thr Tyr Val Trp Lys Pro Asn Asp Asn Val Ser Leu Val						
	180		185		190	
Ser Ala Lys Phe Gly Ala Ser Pro Ala Asp Ile Leu Thr Glu Asn Arg						
	195		200		205	
Tyr Gly Gln Asp Phe Thr Ala Ala Thr Asn Leu Pro Ile Leu Ile Pro						
	210		215		220	
Val Thr Gln Leu Pro Lys Leu Thr Gln Pro Ser Ser Asn Gly Arg Lys						
	225		230		235	240
Ser Ser Ile His Leu Leu Val Ile Leu Gly Ile Thr Leu Gly Cys Thr						
	245		250		255	
Leu Leu Thr Ala Val Leu Thr Gly Thr Leu Val Tyr Val Tyr Cys Arg						
	260		265		270	
Arg Lys Lys Ala Leu Asn Arg Thr Ala Ser Ser Ala Glu Thr Ala Asp						
	275		280		285	
Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Asn Val Tyr						
	290		295		300	
Glu Ile Asp Glu Ile Met Glu Ala Thr Lys Asp Phe Ser Asp Glu Cys						
	305		310		315	320
Lys Val Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu Gly Arg Val Val						
	325		330		335	
Ala Val Lys Lys Ile Lys Glu Gly Gly Ala Asn Glu Glu Leu Lys Ile						
	340		345		350	
Leu Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser						
	355		360		365	
Ser Gly Tyr Asp Gly Asn Cys Phe Leu Val Tyr Glu Tyr Ala Glu Asn						
	370		375		380	

Gly Ser Leu Ala Glu Trp Leu Phe Ser Lys Ser Ser Gly Thr Pro Asn  
385 390 395 400

Ser Leu Thr Trp Ser Gln Arg Ile Ser Ile Ala Val Asp Val Ala Val  
405 410 415

Gly Leu Gln Tyr Met His Glu His Thr Tyr Pro Arg Ile Ile His Arg  
420 425 430

Asp Ile Thr Thr Ser Asn Ile Leu Leu Asp Ser Thr Phe Lys Ala Lys  
435 440 445

Ile Ala Asn Phe Ala Met Ala Arg Thr Ser Thr Asn Pro Met Met Pro  
450 455 460

Lys Ile Asp Val Phe Ala Phe Gly Val Leu Leu Ile Glu Leu Leu Thr  
465 470 475 480

Gly Arg Lys Ala Met Thr Thr Lys Glu Asn Gly Glu Val Val Met Leu  
485 490 495

Trp Lys Asp Met Trp Glu Ile Phe Asp Ile Glu Glu Asn Arg Glu Glu  
500 505 510

Arg Ile Arg Lys Trp Met Asp Pro Asn Leu Glu Ser Phe Tyr His Ile  
515 520 525

Asp Asn Ala Leu Ser Leu Ala Ser Leu Ala Val Asn Cys Thr Ala Asp  
530 535 540

Lys Ser Leu Ser Arg Pro Ser Met Ala Glu Ile Val Leu Ser Leu Ser  
545 550 555 560

Phe Leu Thr Gln Gln Ser Ser Asn Pro Thr Leu Glu Arg Ser Leu Thr  
565 570 575

Ser Ser Gly Leu Asp Val Glu Asp Asp Ala His Ile Val Thr Ser Ile  
580 585 590

Thr Ala Arg  
595

<210> 32  
<211> 595  
<212> PRT  
<213> Medicago truncatula

<220>  
<221> PEPTIDE  
<222> (1)..(595)

<400> 32

Met Ser Ala Phe Phe Leu Pro Ser Ser Ser His Ala Leu Phe Leu Val  
1 5 10 15

Leu Met Leu Phe Phe Leu Thr Asn Ile Ser Ala Gln Pro Leu Tyr Ile  
20 25 30

Ser Glu Thr Asn Phe Thr Cys Pro Val Asp Ser Pro Pro Ser Cys Glu  
35 40 45

Thr Tyr Val Ala Tyr Arg Ala Gln Ser Pro Asn Phe Leu Ser Leu Ser  
50 55 60

Asn Ile Ser Asp Ile Phe Asn Leu Ser Pro Leu Arg Ile Ala Lys Ala  
65 70 75 80

Ser Asn Ile Glu Ala Glu Asp Lys Lys Leu Ile Pro Asp Gln Leu Leu  
85 90 95

Leu Val Pro Val Thr Cys Gly Cys Thr Lys Asn His Ser Phe Ala Asn  
100 105 110

Ile Thr Tyr Ser Ile Lys Gln Gly Asp Asn Phe Phe Ile Leu Ser Ile  
115 120 125

Thr Ser Tyr Gln Asn Leu Thr Asn Tyr Leu Glu Phe Lys Asn Phe Asn  
130 135 140

Pro Asn Leu Ser Pro Thr Leu Leu Pro Leu Asp Thr Lys Val Ser Val  
145 150 155 160

Pro Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asn Lys Gly Ile  
165 170 175

Lys Tyr Leu Ile Thr Tyr Val Trp Gln Asp Asn Asp Asn Val Thr Leu  
180 185 190

Val Ser Ser Lys Phe Gly Ala Ser Gln Val Glu Met Leu Ala Glu Asn  
195 200 205

Asn His Asn Phe Thr Ala Ser Thr Asn Arg Ser Val Leu Ile Pro Val  
210 215 220

Thr Ser Leu Pro Lys Leu Asp Gln Pro Ser Ser Asn Gly Arg Lys Ser  
225 230 235 240

Ser Ser Gln Asn Leu Ala Leu Ile Ile Gly Ile Ser Leu Gly Ser Ala  
245 250 255

Phe Phe Ile Leu Val Leu Thr Leu Ser Leu Val Tyr Val Tyr Cys Leu  
260 265 270

Lys Met Lys Arg Leu Asn Arg Ser Thr Ser Ser Ser Glu Thr Ala Asp  
275 280 285

Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr Met Tyr  
290 295 300

Glu Ile Asp Ala Ile Met Glu Gly Thr Thr Asn Leu Ser Asp Asn Cys  
305 310 315 320

Lys Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Asp Gly Arg Val Leu  
325 330 335

Ala Val Lys Lys Ile Lys Lys Asp Ala Ser Glu Glu Leu Lys Ile Leu  
340 345 350

Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser Ser  
355 360 365

Asp Asn Asp Gly Asn Cys Phe Leu Val Tyr Glu Tyr Ala Glu Asn Gly  
370 375 380

Ser Leu Glu Glu Trp Leu Phe Ser Glu Ser Ser Lys Thr Ser Asn Ser  
385 390 395 400

Val Val Ser Leu Thr Trp Ser Gln Arg Ile Thr Ile Ala Met Asp Val

405	410	415
Ala Ile Gly Leu Gln Tyr Met His Glu His Thr Tyr Pro Arg Ile Ile		
420	425	430
His Arg Asp Ile Thr Thr Ser Asn Ile Leu Leu Gly Ser Asn Phe Lys		
435	440	445
Ala Lys Ile Ala Asn Phe Gly Met Ala Arg Thr Ser Thr Asn Ser Met		
450	455	460
Met Pro Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu Ile Glu Leu		
465	470	475
Leu Thr Gly Lys Lys Ala Met Thr Thr Lys Glu Asn Gly Glu Val Val		
485	490	495
Ile Leu Trp Lys Asp Phe Trp Lys Ile Phe Asp Leu Glu Gly Asn Arg		
500	505	510
Glu Glu Arg Leu Arg Lys Trp Met Asp Pro Lys Leu Glu Ser Phe Tyr		
515	520	525
Pro Ile Asp Asn Ala Leu Ser Leu Ala Ser Leu Ala Val Asn Cys Thr		
530	535	540
Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala Glu Ile Val Leu Cys		
545	550	555
Leu Ser Leu Leu Asn Gln Pro Ser Ser Glu Pro Met Leu Glu Arg Ser		
565	570	575
Leu Thr Ser Gly Leu Asp Ala Glu Ala Thr His Val Val Thr Ser Val		
580	585	590
Ile Ala Arg		
595		

<210> 33  
 <211> 24  
 <212> DNA  
 <213> Phaseolus vulgaris

<220>  
<221> misc\_feature  
<222> (1)..(24)  
<223> Primer to amplify fragment of NPR5

<400> 33  
cattgcaara gccagtaaca taga  
24

<210> 34  
<211> 30  
<212> DNA  
<213> Phaseolus vulgaris

<220>  
<221> misc\_feature  
<222> (1)..(30)  
<223> To amplify a fragment of NPR5

<400> 34  
aacgwgcwry wayrgaagtm acaayatgag  
30

<210> 35  
<211> 35  
<212> DNA  
<213> Phaseolus vulgaris

<220>  
<221> misc\_feature  
<222> (1)..(35)  
<223> NPR5 5'RACE primer

<400> 35  
cgactgggat atgtatgtca catatgtttc acatg  
35

<210> 36  
<211> 22  
<212> DNA  
<213> Phaseolus vulgaris

<220>  
<221> misc\_feature  
<222> (1)..(22)  
<223> NPR5 3' RACE primer

<400> 36  
gatagaattg cttactggca gg  
22

<210> 37  
<211> 21  
<212> DNA  
<213> Phaseolus vulgaris

<220>  
<221> misc\_feature  
<222> (1)..(21)  
<223> NPR5 gene PCR primer

<400> 37  
gacgtgtcca ctgtatccag g  
21

<210> 38  
<211> 24  
<212> DNA  
<213> Phaseolus vulgaris

<220>  
<221> misc\_feature  
<222> (1)..(24)  
<223> NPR5 gene PCR primer

<400> 38  
gttttgacat gcaataaaca actc  
24

<210> 39  
<211> 2164  
<212> DNA  
<213> Phaseolus vulgaris

<220>  
<221> 5'UTR  
<222> (1)..(172)

<220>  
<221> CDS  
<222> (173)..(1963)

<220>  
<221> 3'UTR  
<222> (1964)..(2164)

<400> 39  
ggattcggaa agccaaaagg aaatttagtt aaagctaattg acacaaacag gaccatattt  
60

ttatatattaag ccaaaagata tttttattga caaagaacta catatcaaca acgacgattg  
120



ccagtgatag tagactgcct cataactttc atttggtcac aacttcacat ca atg gct  
178

Met Ala  
1

gtc ttc ttt gtt tct ctt act ctt ggt gct cag att ctt tat gtg gta  
226

Val Phe Phe Val Ser Leu Thr Leu Gly Ala Gln Ile Leu Tyr Val Val  
5 10 15

ctc atg ttt ttc act tgt att gaa gct caa tca caa cag acc aat gga  
274

Leu Met Phe Phe Thr Cys Ile Glu Ala Gln Ser Gln Gln Thr Asn Gly  
20 25 30

aca aac ttt tca tgc cct tcc aat tca cct cct tca tgt gaa aca tat  
322

Thr Asn Phe Ser Cys Pro Ser Asn Ser Pro Pro Ser Cys Glu Thr Tyr  
35 40 45 50

gtg aca tac ata tcc cag tcg cca aat ttt ttg agt ctg acc agc gta  
370

Val Thr Tyr Ile Ser Gln Ser Pro Asn Phe Leu Ser Leu Thr Ser Val  
55 60 65

tct aat ata ttt gac acg agt cct ttg tca att gcc aga gcc agc aac  
418

Ser Asn Ile Phe Asp Thr Ser Pro Leu Ser Ile Ala Arg Ala Ser Asn  
70 75 80

tta cag cat gag gaa gac aag ttg att cca ggc caa gtc tta ctg ata  
466

Leu Gln His Glu Glu Asp Lys Leu Ile Pro Gly Gln Val Leu Leu Ile  
85 90 95

cca gta acc tgt ggt tgc act gga aac cgc tct ttc gcc aac atc tcc  
514

Pro Val Thr Cys Gly Cys Thr Gly Asn Arg Ser Phe Ala Asn Ile Ser  
100 105 110

tat gag atc aac caa ggt gat agc ttc tac ttt gtt gcg acc act tta  
562

Tyr Glu Ile Asn Gln Gly Asp Ser Phe Tyr Phe Val Ala Thr Thr Leu  
115 120 125 130

tac cag aat ctc aca aat tgg cat gca gtg atg gat tta aac cca ggt  
610

Tyr Gln Asn Leu Thr Asn Trp His Ala Val Met Asp Leu Asn Pro Gly  
135 140 145

cta agt caa ttt act ttg cca ata ggc atc caa gtt gta att cct tta  
658

Leu Ser Gln Phe Thr Leu Pro Ile Gly Ile Gln Val Val Ile Pro Leu  
150 155 160

ttc tgc aag tgt cct tca aag aac cag ctg gat aga ggg ata aag tac  
706  
Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asp Arg Gly Ile Lys Tyr  
165 170 175

ctg atc act cac gtc tgg cag ccc aat gac aat gtt tcc ttt gta agt  
754  
Leu Ile Thr His Val Trp Gln Pro Asn Asp Asn Val Ser Phe Val Ser  
180 185 190

aac aag tta ggt gca tca cca cag gac ata ttg agt gaa aac aac tat  
802  
Asn Lys Leu Gly Ala Ser Pro Gln Asp Ile Leu Ser Glu Asn Asn Tyr  
195 200 205 210

ggc caa aat ttc act gcc gca agc aac ctt cca gtt ttg atc cca gtt  
850  
Gly Gln Asn Phe Thr Ala Ala Ser Asn Leu Pro Val Leu Ile Pro Val  
215 220 225

aca ctc ttg cca gat ctt att caa tct cct tca gat gga aga aaa cac  
898  
Thr Leu Leu Pro Asp Leu Ile Gln Ser Pro Ser Asp Gly Arg Lys His  
230 235 240

aga att ggt ctt cca gtt ata att ggt atc agc ctg gga tgc aca cta  
946  
Arg Ile Gly Leu Pro Val Ile Ile Gly Ile Ser Leu Gly Cys Thr Leu  
245 250 255

ctg gtt gtg gtt tca gca ata tta ctg gtg tgt gta tgt tgt ctg aaa  
994  
Leu Val Val Val Ser Ala Ile Leu Leu Val Cys Val Cys Cys Leu Lys  
260 265 270

atg aag agt ttg aat agg agt gct tca tca gct gaa act gca gat aaa  
1042  
Met Lys Ser Leu Asn Arg Ser Ala Ser Ser Ala Glu Thr Ala Asp Lys  
275 280 285 290

cta ctt tct gga gtt tca ggc tat gta agt aag cct aca atg tat gaa  
1090  
Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr Met Tyr Glu  
295 300 305

act ggt gca ata ttg gaa gct act atg aac ctc agt gag cag tgc aag  
1138  
Thr Gly Ala Ile Leu Glu Ala Thr Met Asn Leu Ser Glu Gln Cys Lys  
310 315 320

att ggg gaa tca gtg tac aag gct aac ata gag ggt aag gtt tta gca  
1186  
Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu Gly Lys Val Leu Ala  
325 330 335

gta aaa aga ttc aag gaa gat gtc acg gag gag ctg aaa att ctg cag  
1234

Val Lys Arg Phe Lys Glu Asp Val Thr Glu Glu Leu Lys Ile Leu Gln  
 340 345 350  
 aag gtg aat cat gga aat ctg gtg aaa cta atg ggt gtc tca tca gat  
 1282  
 Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser Ser Asp  
 355 360 365 370  
 aat gat gga aat tgt ttt gtg gtt tat gaa tat gct gaa aat ggg tct  
 1330  
 Asn Asp Gly Asn Cys Phe Val Val Tyr Glu Tyr Ala Glu Asn Gly Ser  
 375 380 385  
 ctt gaa gag tgg ctt ttc gcc aag tct tgt tca gag aca tca aac tca  
 1378  
 Leu Glu Glu Trp Leu Phe Ala Lys Ser Cys Ser Glu Thr Ser Asn Ser  
 390 395 400  
 agg acc tcc ctt aca tgg tgc cag agg ata agc ata gca gtg gat gtt  
 1426  
 Arg Thr Ser Leu Thr Trp Cys Gln Arg Ile Ser Ile Ala Val Asp Val  
 405 410 415  
 tca atg ggt ctg cag tac atg cat gaa cat gct tat cca aga ata gtc  
 1474  
 Ser Met Gly Leu Gln Tyr Met His Glu His Ala Tyr Pro Arg Ile Val  
 420 425 430  
 cac agg gac atc aca agc agt aat atc ctt ctt gac tcc aac ttt aag  
 1522  
 His Arg Asp Ile Thr Ser Ser Asn Ile Leu Leu Asp Ser Asn Phe Lys  
 435 440 445 450  
 gcc aag ata gca aat ttc tcc atg gcc aga act ttt acc aac ccc atg  
 1570  
 Ala Lys Ile Ala Asn Phe Ser Met Ala Arg Thr Phe Thr Asn Pro Met  
 455 460 465  
 atg tca aaa ata gat gta ttt gct ttt ggg gtg gtt ctg ata gaa ttg  
 1618  
 Met Ser Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu Ile Glu Leu  
 470 475 480  
 ctt act ggc agg aaa gcc atg aca acc aaa gaa aat ggt gag gtg gtt  
 1666  
 Leu Thr Gly Arg Lys Ala Met Thr Thr Lys Glu Asn Gly Glu Val Val  
 485 490 495  
 atg ctg tgg aag gac att tgg aag atc ttt gat caa gaa gag aat aga  
 1714  
 Met Leu Trp Lys Asp Ile Trp Lys Ile Phe Asp Gln Glu Glu Asn Arg  
 500 505 510  
 gag gag agg ctc aga aaa tgg atg gat cct aag tta gat aat tat tat  
 1762  
 Glu Glu Arg Leu Arg Lys Trp Met Asp Pro Lys Leu Asp Asn Tyr Tyr  
 515 520 525 530

cct att gat tat gct ctc agc ttg gcc tcc ttg gca gtg aat tgc act  
1810

Pro Ile Asp Tyr Ala Leu Ser Leu Ala Ser Leu Ala Val Asn Cys Thr  
535 540 545

gca gac aag tct ttg tcc aga cca acc ata gca gaa att gtc ctt agt  
1858

Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala Glu Ile Val Leu Ser  
550 555 560

ctc tcc ctt ctc act caa cca tct ccc gcg aca ctg gag aga tcc ttg  
1906

Leu Ser Leu Leu Thr Gln Pro Ser Pro Ala Thr Leu Glu Arg Ser Leu  
565 570 575

act tct tct gga tta gat gta gaa gct act caa att gtc act tcc atc  
1954

Thr Ser Ser Gly Leu Asp Val Glu Ala Thr Gln Ile Val Thr Ser Ile  
580 585 590

tca gct cgt tgattgagtg aagccaatct agtttctcac atccaagatg  
2003

Ser Ala Arg  
595

gtactttttt ttaaataatg attgcacctt agtcaataat gatgaacttg gtttatgggg  
2063

agttttcaac atttagtggt tccatccctg ttgttcttta tgtttgaggt agagttogta  
2123

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2164

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<211> 597

<212> PRT

<213> Phaseolus vulgaris

<400> 40

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Asn Gly Thr Asn Phe Ser Cys Pro Ser Asn Ser Pro Pro Ser Cys Glu  
35 40 45

Thr Tyr Val Thr Tyr Ile Ser Gln Ser Pro Asn Phe Leu Ser Leu Thr  
50 55 60

Ser Val Ser Asn Ile Phe Asp Thr Ser Pro Leu Ser Ile Ala Arg Ala  
65 70 75 80

Ser Asn Leu Gln His Glu Glu Asp Lys Leu Ile Pro Gly Gln Val Leu  
85 90 95

Leu Ile Pro Val Thr Cys Gly Cys Thr Gly Asn Arg Ser Phe Ala Asn  
100 105 110

Ile Ser Tyr Glu Ile Asn Gln Gly Asp Ser Phe Tyr Phe Val Ala Thr  
115 120 125

Thr Leu Tyr Gln Asn Leu Thr Asn Trp His Ala Val Met Asp Leu Asn  
130 135 140

Pro Gly Leu Ser Gln Phe Thr Leu Pro Ile Gly Ile Gln Val Val Ile  
145 150 155 160

Pro Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asp Arg Gly Ile  
165 170 175

Lys Tyr Leu Ile Thr His Val Trp Gln Pro Asn Asp Asn Val Ser Phe  
180 185 190

Val Ser Asn Lys Leu Gly Ala Ser Pro Gln Asp Ile Leu Ser Glu Asn  
195 200 205

Asn Tyr Gly Gln Asn Phe Thr Ala Ala Ser Asn Leu Pro Val Leu Ile  
210 215 220

Pro Val Thr Leu Leu Pro Asp Leu Ile Gln Ser Pro Ser Asp Gly Arg  
225 230 235 240

Lys His Arg Ile Gly Leu Pro Val Ile Ile Gly Ile Ser Leu Gly Cys  
245 250 255

Thr Leu Leu Val Val Val Ser Ala Ile Leu Leu Val Cys Val Cys Cys  
260 265 270

Leu Lys Met Lys Ser Leu Asn Arg Ser Ala Ser Ser Ala Glu Thr Ala  
275 280 285

Asp Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr Met  
290 295 300

Tyr Glu Thr Gly Ala Ile Leu Glu Ala Thr Met Asn Leu Ser Glu Gln  
305 310 315 320

Cys Lys Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu Gly Lys Val  
325 330 335

Leu Ala Val Lys Arg Phe Lys Glu Asp Val Thr Glu Glu Leu Lys Ile  
340 345 350

Leu Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val Ser  
355 360 365

Ser Asp Asn Asp Gly Asn Cys Phe Val Val Tyr Glu Tyr Ala Glu Asn  
370 375 380

Gly Ser Leu Glu Glu Trp Leu Phe Ala Lys Ser Cys Ser Glu Thr Ser  
385 390 395 400

Asn Ser Arg Thr Ser Leu Thr Trp Cys Gln Arg Ile Ser Ile Ala Val  
405 410 415

Asp Val Ser Met Gly Leu Gln Tyr Met His Glu His Ala Tyr Pro Arg  
420 425 430

Ile Val His Arg Asp Ile Thr Ser Ser Asn Ile Leu Leu Asp Ser Asn  
435 440 445

Phe Lys Ala Lys Ile Ala Asn Phe Ser Met Ala Arg Thr Phe Thr Asn  
450 455 460

Pro Met Met Ser Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu Ile  
465 470 475 480

Glu Leu Leu Thr Gly Arg Lys Ala Met Thr Thr Lys Glu Asn Gly Glu  
485 490 495

Val Val Met Leu Trp Lys Asp Ile Trp Lys Ile Phe Asp Gln Glu Glu  
500 505 510

Asn Arg Glu Glu Arg Leu Arg Lys Trp Met Asp Pro Lys Leu Asp Asn  
515 520 525

Tyr Tyr Pro Ile Asp Tyr Ala Leu Ser Leu Ala Ser Leu Ala Val Asn  
530 535 540

Cys Thr Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala Glu Ile Val  
545 550 555 560

Leu Ser Leu Ser Leu Leu Thr Gln Pro Ser Pro Ala Thr Leu Glu Arg  
565 570 575

Ser Leu Thr Ser Ser Gly Leu Asp Val Glu Ala Thr Gln Ile Val Thr  
580 585 590

Ser Ile Ser Ala Arg  
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24

<210> 42  
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<210> 43

<211> 31  
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19

<210> 45  
<211> 26  
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26

<210> 46  
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24

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110  
Met Ala Val Phe Phe Pro Phe Leu Pro Leu His Ser Gln Ile  
1 5 10

ctt tgt ctt gtg atc atg ttg ttt tcc act aat att gta gct caa tca  
158  
Leu Cys Leu Val Ile Met Leu Phe Ser Thr Asn Ile Val Ala Gln Ser  
15 20 25 30

caa cag gac aat aga aca aac ttt tca tgc cct tct gat tca ccg cct  
206  
Gln Gln Asp Asn Arg Thr Asn Phe Ser Cys Pro Ser Asp Ser Pro Pro  
35 40 45

tca tgt gaa acc tat gta aca tac att gct cag tct cca aat ttt ttg  
254  
Ser Cys Glu Thr Tyr Val Thr Tyr Ile Ala Gln Ser Pro Asn Phe Leu  
50 55 60

agt cta acc aac ata tcc aat ata ttt gac aca agc cct tta tcc att  
302  
Ser Leu Thr Asn Ile Ser Asn Ile Phe Asp Thr Ser Pro Leu Ser Ile  
65 70 75

gca aga gcc agt aac tta gag cct atg gat gac aag cta gtc aaa gac  
350  
Ala Arg Ala Ser Asn Leu Glu Pro Met Asp Asp Lys Leu Val Lys Asp  
80 85 90

caa gtc tta ctc gta cca gta acc tgt ggt tgc act gga aac cgc tct  
 398  
 Gln Val Leu Leu Val Pro Val Thr Cys Gly Cys Thr Gly Asn Arg Ser  
 95 100 105 110

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 446  
 Phe Ala Asn Ile Ser Tyr Glu Ile Asn Gln Gly Asp Ser Phe Tyr Phe  
 115 120 125

gtt gca acc act tca tac gag aat ctc acg aat tgg cgt gca gtg atg  
 494  
 Val Ala Thr Thr Ser Tyr Glu Asn Leu Thr Asn Trp Arg Ala Val Met  
 130 135 140

gat tta aac ccc gtt cta agt cca aat aag ttg cca ata gga atc caa  
 542  
 Asp Leu Asn Pro Val Leu Ser Pro Asn Lys Leu Pro Ile Gly Ile Gln  
 145 150 155

gta gta ttt cct tta ttc tgc aag tgc cct tca aag aac cag ttg gac  
 590  
 Val Val Phe Pro Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asp  
 160 165 170

aaa gag ata aag tac ctg att aca tac gtg tgg aag ccc ggt gac aat  
 638  
 Lys Glu Ile Lys Tyr Leu Ile Thr Tyr Val Trp Lys Pro Gly Asp Asn  
 175 180 185 190

gtt tcc ctt gta agt gac aag ttt ggt gca tca cca gag gac ata atg  
 686  
 Val Ser Leu Val Ser Asp Lys Phe Gly Ala Ser Pro Glu Asp Ile Met  
 195 200 205

agt gaa aac aac tat ggt cag aac ttt act gct gca aac aac ctt cca  
 734  
 Ser Glu Asn Asn Tyr Gly Gln Asn Phe Thr Ala Ala Asn Asn Leu Pro  
 210 215 220

gtt ctg atc cca gtg aca cgc ttg cca gtt ctt gct cga tct cct tcg  
 782  
 Val Leu Ile Pro Val Thr Arg Leu Pro Val Leu Ala Arg Ser Pro Ser  
 225 230 235

gac gga aga aaa ggc gga att cgt ctt ccg gtt ata att ggt att agc  
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 Asp Gly Arg Lys Gly Gly Ile Arg Leu Pro Val Ile Ile Gly Ile Ser  
 240 245 250

ttg gga tgc acg cta ctg gtt ctg gtt tta gca gtg tta ctg gtg tat  
 878  
 Leu Gly Cys Thr Leu Leu Val Leu Val Leu Ala Val Leu Leu Val Tyr  
 255 260 265 270

gta tat tgt ctg aaa atg aag act ttg aat agg agt gct tca tcg gct  
 926  
 Val Tyr Cys Leu Lys Met Lys Thr Leu Asn Arg Ser Ala Ser Ser Ala  
 275 280 285

gaa act gca gat aaa cta ctt tct gga gtt tca ggc tat gta agt aag  
 974  
 Glu Thr Ala Asp Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys  
 290 295 300

cct acc atg tat gaa act gat gcg atc atg gaa gct aca atg aac ctc  
 1022  
 Pro Thr Met Tyr Glu Thr Asp Ala Ile Met Glu Ala Thr Met Asn Leu  
 305 310 315

agt gag cag tgc aag att ggg gaa tca gtg tac aag gca aac ata gag  
 1070  
 Ser Glu Gln Cys Lys Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu  
 320 325 330

ggt aag gtt ttg gca gta aaa aga ttc aag gaa gat gtc acg gaa gag  
 1118  
 Gly Lys Val Leu Ala Val Lys Arg Phe Lys Glu Asp Val Thr Glu Glu  
 335 340 345 350

ctg aaa att ctg cag aag gtg aat cat ggg aat ctg gtg aaa cta atg  
 1166  
 Leu Lys Ile Leu Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met  
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 1214  
 Gly Val Ser Ser Asp Asn Asp Gly Asn Cys Phe Val Val Tyr Glu Tyr  
 370 375 380

gct gaa aat ggg tct ctt gat gag tgg cta ttc tcc aag tct tgt tca  
 1262  
 Ala Glu Asn Gly Ser Leu Asp Glu Trp Leu Phe Ser Lys Ser Cys Ser  
 385 390 395

gac aca tca aac tca agg gca tcc ctt aca tgg tgt cag agg ata agc  
 1310  
 Asp Thr Ser Asn Ser Arg Ala Ser Leu Thr Trp Cys Gln Arg Ile Ser  
 400 405 410

atg gca gtg gat gtt gcg atg ggt ttg cag tac atg cat gaa cat gct  
 1358  
 Met Ala Val Asp Val Ala Met Gly Leu Gln Tyr Met His Glu His Ala  
 415 420 425 430

tat cca aga ata gtc cac agg gac atc aca agc agt aat atc ctt ctt  
 1406  
 Tyr Pro Arg Ile Val His Arg Asp Ile Thr Ser Ser Asn Ile Leu Leu  
 435 440 445

gac tcg aac ttt aag gcc aag ata gca aat ttc tcc atg gcc aga act  
 1454

Asp Ser Asn Phe Lys Ala Lys Ile Ala Asn Phe Ser Met Ala Arg Thr  
450 455 460

ttt acc aac ccc atg atg cca aag ata gat gtc ttt gca ttt ggg gtg  
1502

Phe Thr Asn Pro Met Met Pro Lys Ile Asp Val Phe Ala Phe Gly Val  
465 470 475

gtt ctg att gag ttg ctt acc gga agg aaa gcc atg aca acc aag gaa  
1550

Val Leu Ile Glu Leu Leu Thr Gly Arg Lys Ala Met Thr Thr Lys Glu  
480 485 490

aat ggt gag gtg gtc atg ctg tgg aag gac att tgg aag atc ttt gat  
1598

Asn Gly Glu Val Val Met Leu Trp Lys Asp Ile Trp Lys Ile Phe Asp  
495 500 505 510

caa gaa gag aat aga gag gag agg ctc aaa aaa tgg atg gat cct aag  
1646

Gln Glu Glu Asn Arg Glu Glu Arg Leu Lys Lys Trp Met Asp Pro Lys  
515 520 525

tta gag agt tat tat cct ata gat tac gct ctc agc ttg gcc tcc ttg  
1694

Leu Glu Ser Tyr Tyr Pro Ile Asp Tyr Ala Leu Ser Leu Ala Ser Leu  
530 535 540

gcg gtg aat tgt act gca gat aag tct ttg tcc aga cca acc att gca  
1742

Ala Val Asn Cys Thr Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala  
545 550 555

gaa att gtc ctt agc ctc tcc ctt ctc act caa cca tct ccc gca aca  
1790

Glu Ile Val Leu Ser Leu Ser Leu Leu Thr Gln Pro Ser Pro Ala Thr  
560 565 570

ttg gag aga tcc ttg act tct tct gga ttg gat gta gaa gct act caa  
1838

Leu Glu Arg Ser Leu Thr Ser Ser Gly Leu Asp Val Glu Ala Thr Gln  
575 580 585 590

att gtc act tcc ata gca gct cgt tgattgagtg aaggaaattt agttttctcaa  
1892

Ile Val Thr Ser Ile Ala Ala Arg  
595

atccatgatg gtattttgtt tacatgatga ttattacatc tttagtcatt aatggttggc  
1952

ttgggttggg ggagtgtgtt caaaatttcg tttttttcca tccctgttat tttttttaag  
2012

tttggggtag agtcagcaaa aatggaagtt gcaattgacc tcagactaaa cttgcttatt  
2072

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2130

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<400> 48

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20 25 30

Asp Asn Arg Thr Asn Phe Ser Cys Pro Ser Asp Ser Pro Pro Ser Cys  
35 40 45

Glu Thr Tyr Val Thr Tyr Ile Ala Gln Ser Pro Asn Phe Leu Ser Leu  
50 55 60

Thr Asn Ile Ser Asn Ile Phe Asp Thr Ser Pro Leu Ser Ile Ala Arg  
65 70 75 80

Ala Ser Asn Leu Glu Pro Met Asp Asp Lys Leu Val Lys Asp Gln Val  
85 90 95

Leu Leu Val Pro Val Thr Cys Gly Cys Thr Gly Asn Arg Ser Phe Ala  
100 105 110

Asn Ile Ser Tyr Glu Ile Asn Gln Gly Asp Ser Phe Tyr Phe Val Ala  
115 120 125

Thr Thr Ser Tyr Glu Asn Leu Thr Asn Trp Arg Ala Val Met Asp Leu  
130 135 140

Asn Pro Val Leu Ser Pro Asn Lys Leu Pro Ile Gly Ile Gln Val Val  
145 150 155 160

Phe Pro Leu Phe Cys Lys Cys Pro Ser Lys Asn Gln Leu Asp Lys Glu  
165 170 175

Ile Lys Tyr Leu Ile Thr Tyr Val Trp Lys Pro Gly Asp Asn Val Ser  
180 185 190

Leu Val Ser Asp Lys Phe Gly Ala Ser Pro Glu Asp Ile Met Ser Glu  
195 200 205

Asn Asn Tyr Gly Gln Asn Phe Thr Ala Ala Asn Asn Leu Pro Val Leu  
210 215 220

Ile Pro Val Thr Arg Leu Pro Val Leu Ala Arg Ser Pro Ser Asp Gly  
225 230 235 240

Arg Lys Gly Gly Ile Arg Leu Pro Val Ile Ile Gly Ile Ser Leu Gly  
245 250 255

Cys Thr Leu Leu Val Leu Val Leu Ala Val Leu Leu Val Tyr Val Tyr  
260 265 270

Cys Leu Lys Met Lys Thr Leu Asn Arg Ser Ala Ser Ser Ala Glu Thr  
275 280 285

Ala Asp Lys Leu Leu Ser Gly Val Ser Gly Tyr Val Ser Lys Pro Thr  
290 295 300

Met Tyr Glu Thr Asp Ala Ile Met Glu Ala Thr Met Asn Leu Ser Glu  
305 310 315 320

Gln Cys Lys Ile Gly Glu Ser Val Tyr Lys Ala Asn Ile Glu Gly Lys  
325 330 335

Val Leu Ala Val Lys Arg Phe Lys Glu Asp Val Thr Glu Glu Leu Lys  
340 345 350

Ile Leu Gln Lys Val Asn His Gly Asn Leu Val Lys Leu Met Gly Val  
355 360 365

Ser Ser Asp Asn Asp Gly Asn Cys Phe Val Val Tyr Glu Tyr Ala Glu  
370 375 380

Asn Gly Ser Leu Asp Glu Trp Leu Phe Ser Lys Ser Cys Ser Asp Thr  
385 390 395 400

Ser Asn Ser Arg Ala Ser Leu Thr Trp Cys Gln Arg Ile Ser Met Ala  
405 410 415

Val Asp Val Ala Met Gly Leu Gln Tyr Met His Glu His Ala Tyr Pro  
420 425 430

Arg Ile Val His Arg Asp Ile Thr Ser Ser Asn Ile Leu Leu Asp Ser  
435 440 445

Asn Phe Lys Ala Lys Ile Ala Asn Phe Ser Met Ala Arg Thr Phe Thr  
450 455 460

Asn Pro Met Met Pro Lys Ile Asp Val Phe Ala Phe Gly Val Val Leu  
465 470 475 480

Ile Glu Leu Leu Thr Gly Arg Lys Ala Met Thr Thr Lys Glu Asn Gly  
485 490 495

Glu Val Val Met Leu Trp Lys Asp Ile Trp Lys Ile Phe Asp Gln Glu  
500 505 510

Glu Asn Arg Glu Glu Arg Leu Lys Lys Trp Met Asp Pro Lys Leu Glu  
515 520 525

Ser Tyr Tyr Pro Ile Asp Tyr Ala Leu Ser Leu Ala Ser Leu Ala Val  
530 535 540

Asn Cys Thr Ala Asp Lys Ser Leu Ser Arg Pro Thr Ile Ala Glu Ile  
545 550 555 560

Val Leu Ser Leu Ser Leu Leu Thr Gln Pro Ser Pro Ala Thr Leu Glu  
565 570 575

Arg Ser Leu Thr Ser Ser Gly Leu Asp Val Glu Ala Thr Gln Ile Val  
580 585 590

Thr Ser Ile Ala Ala Arg  
595

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22

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19

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60

caaat atg aaa cta aaa aat ggc tta ctc ttg ttc ttt cta ttt gtg gag  
110

Met	Lys	Leu	Lys	Asn	Gly	Leu	Leu	Leu	Phe	Phe	Leu	Phe	Val	Glu
1				5					10				15	

tgt gct ttt ttc aaa gtg gat tca aag tgt gtg aaa ggg tgt gat cta  
158

Cys	Ala	Phe	Phe	Lys	Val	Asp	Ser	Lys	Cys	Val	Lys	Gly	Cys	Asp	Leu
				20				25					30		



gct tta gct tct tac tat gta atg cct tta gtt gaa ctc cca act ata  
206  
Ala Leu Ala Ser Tyr Tyr Val Met Pro Leu Val Glu Leu Pro Thr Ile  
35 40 45

aaa aac tat atg caa tca aag ata gtt acc aac tct tct gat gtt tta  
254  
Lys Asn Tyr Met Gln Ser Lys Ile Val Thr Asn Ser Ser Asp Val Leu  
50 55 60

aat agt tac aac aaa gtc tta gta acc aat cat ggt aat att ttt tcc  
302  
Asn Ser Tyr Asn Lys Val Leu Val Thr Asn His Gly Asn Ile Phe Ser  
65 70 75

tat ttt aga atc aac att cca ttc cca tgt gaa tgt att gga ggt gag  
350  
Tyr Phe Arg Ile Asn Ile Pro Phe Pro Cys Glu Cys Ile Gly Gly Glu  
80 85 90 95

ttc tta gga cat gtg ttt gaa tat aca aca aag aaa gga gat act tat  
398  
Phe Leu Gly His Val Phe Glu Tyr Thr Thr Lys Lys Gly Asp Thr Tyr  
100 105 110

gat ttg att gca aat aat tat tat gta agt ttg act agt gtt gag ctt  
446  
Asp Leu Ile Ala Asn Asn Tyr Tyr Val Ser Leu Thr Ser Val Glu Leu  
115 120 125

ttg aag aag ttt aac agc tat gat cca aat cat ata cct gct aag gct  
494  
Leu Lys Lys Phe Asn Ser Tyr Asp Pro Asn His Ile Pro Ala Lys Ala  
130 135 140

aag gtt aat gtt act gtg aat tgt tct tgt ggg aat agc cag att tca  
542  
Lys Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Ile Ser  
145 150 155

aaa gat tat ggc ttg ttt gtt act tat ccg tta agg tct acg gat tct  
590  
Lys Asp Tyr Gly Leu Phe Val Thr Tyr Pro Leu Arg Ser Thr Asp Ser  
160 165 170 175

ctt gag aag att gcg aac gag tcg aaa ctt gat gaa ggg ttg ata cag  
638  
Leu Glu Lys Ile Ala Asn Glu Ser Lys Leu Asp Glu Gly Leu Ile Gln  
180 185 190

aat ttc aac cct gat gtc aat ttc agt aga gga agt ggg ata gtg ttc  
686  
Asn Phe Asn Pro Asp Val Asn Phe Ser Arg Gly Ser Gly Ile Val Phe  
195 200 205

att cca gga aga gat aaa aat gga gaa tat gtt cct ttg tat cct aaa  
734

Ile	Pro	Gly	Arg	Asp	Lys	Asn	Gly	Glu	Tyr	Val	Pro	Leu	Tyr	Pro	Lys
		210					215					220			
aca	ggt	ggt	ggt	aag	ggt	gta	gct	att	ggt	ata	tct	ata	gca	gga	gta
782															
Thr	Gly	Val	Gly	Lys	Gly	Val	Ala	Ile	Gly	Ile	Ser	Ile	Ala	Gly	Val
	225					230					235				
ttt	gcg	ggt	ctg	tta	ttt	ggt	atc	tgt	ata	tat	gtc	aaa	tac	ttc	cag
830															
Phe	Ala	Val	Leu	Leu	Phe	Val	Ile	Cys	Ile	Tyr	Val	Lys	Tyr	Phe	Gln
240					245					250					255
aaa	aag	gaa	gaa	gag	aaa	act	ata	ctg	ccc	caa	ggt	tct	aag	gcg	ctt
878															
Lys	Lys	Glu	Glu	Glu	Lys	Thr	Ile	Leu	Pro	Gln	Val	Ser	Lys	Ala	Leu
				260					265					270	
tcg	act	caa	gat	ggt	aat	gcc	tcg	agt	agt	gga	gaa	tat	gaa	act	tca
926															
Ser	Thr	Gln	Asp	Gly	Asn	Ala	Ser	Ser	Ser	Gly	Glu	Tyr	Glu	Thr	Ser
			275					280					285		
gga	tct	agt	ggg	cat	ggt	act	ggt	agt	gct	gca	ggc	ctc	aca	gga	atc
974															
Gly	Ser	Ser	Gly	His	Gly	Thr	Gly	Ser	Ala	Ala	Gly	Leu	Thr	Gly	Ile
		290					295					300			
atg	gtg	gca	aag	tca	act	gag	ttt	tca	tat	caa	gag	cta	gcc	aag	gct
1022															
Met	Val	Ala	Lys	Ser	Thr	Glu	Phe	Ser	Tyr	Gln	Glu	Leu	Ala	Lys	Ala
	305					310					315				
aca	gat	aac	ttt	agt	ttg	gat	aat	aaa	atc	ggt	caa	ggt	gga	ttt	gga
1070															
Thr	Asp	Asn	Phe	Ser	Leu	Asp	Asn	Lys	Ile	Gly	Gln	Gly	Gly	Phe	Gly
320					325					330					335
gct	gtc	tat	tat	gca	gaa	ctc	aga	ggc	gag	aaa	aca	gca	atc	aag	aag
1118															
Ala	Val	Tyr	Tyr	Ala	Glu	Leu	Arg	Gly	Glu	Lys	Thr	Ala	Ile	Lys	Lys
				340					345					350	
atg	aat	gtg	caa	gca	tca	tca	gaa	ttt	ctg	tgt	gag	ttg	aag	gtc	tta
1166															
Met	Asn	Val	Gln	Ala	Ser	Ser	Glu	Phe	Leu	Cys	Glu	Leu	Lys	Val	Leu
			355					360					365		
acg	cac	ggt	cat	cat	ttg	aat	ctg	gtg	agg	ttg	att	gga	tat	tgc	ggt
1214															
Thr	His	Val	His	His	Leu	Asn	Leu	Val	Arg	Leu	Ile	Gly	Tyr	Cys	Val
		370					375					380			
gag	ggg	tcg	ctt	ttc	ctt	gtc	tat	gaa	cat	att	gac	aat	gga	aac	ttg
1262															
Glu	Gly	Ser	Leu	Phe	Leu	Val	Tyr	Glu	His	Ile	Asp	Asn	Gly	Asn	Leu
	385					390					395				

ggt caa tat ttg cat ggt aaa gat aaa gag cca tta cca tgg tct agt  
 1310  
 Gly Gln Tyr Leu His Gly Lys Asp Lys Glu Pro Leu Pro Trp Ser Ser  
 400 405 410 415  
  
 aga gtc caa att gct cta gat tca gca cga ggc ctt gaa tac att cat  
 1358  
 Arg Val Gln Ile Ala Leu Asp Ser Ala Arg Gly Leu Glu Tyr Ile His  
 420 425 430  
  
 gaa cat acc gtg cct gtg tat atc cat cgc gat gta aaa tca gca aac  
 1406  
 Glu His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala Asn  
 435 440 445  
  
 ata ttg ata gac aaa aac ttg cgc gga aag gtt gca gat ttt ggc ttg  
 1454  
 Ile Leu Ile Asp Lys Asn Leu Arg Gly Lys Val Ala Asp Phe Gly Leu  
 450 455 460  
  
 acc aaa ctt att gaa gtt gga aat tcc aca ctt cac act cgt ctt gtt  
 1502  
 Thr Lys Leu Ile Glu Val Gly Asn Ser Thr Leu His Thr Arg Leu Val  
 465 470 475  
  
 gga act ttt gga tac atg cca cca gaa tat gct caa tat ggt gac gtt  
 1550  
 Gly Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp Val  
 480 485 490 495  
  
 tct ccg aaa ata gac gta tat gct ttt gga gtt gtt ctt tat gaa ctg  
 1598  
 Ser Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Tyr Glu Leu  
 500 505 510  
  
 ata tct gca aag aat gct gtt ctg aag aca ggt gaa gaa tct gtt gct  
 1646  
 Ile Ser Ala Lys Asn Ala Val Leu Lys Thr Gly Glu Glu Ser Val Ala  
 515 520 525  
  
 gaa tca aag ggt ctt gta gcc ttg ttt gaa aaa gca ctt aat cag att  
 1694  
 Glu Ser Lys Gly Leu Val Ala Leu Phe Glu Lys Ala Leu Asn Gln Ile  
 530 535 540  
  
 gat cct tca gaa gct ctt cgc aaa ttg gtg gat cct agg ctt aaa gaa  
 1742  
 Asp Pro Ser Glu Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Lys Glu  
 545 550 555  
  
 aac tat cca att gat tct gtt tta aag atg gct caa ctt ggg aga gca  
 1790  
 Asn Tyr Pro Ile Asp Ser Val Leu Lys Met Ala Gln Leu Gly Arg Ala  
 560 565 570 575

tgt aca aga gat aat cca cta cta cgc cca agt atg aga tct tta gtt  
1838

Cys Thr Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val  
580 585 590

gtt gat ctt atg aca ctg tca tca cca ttt gaa gat tgt gat gat gac  
1886

Val Asp Leu Met Thr Leu Ser Ser Pro Phe Glu Asp Cys Asp Asp Asp  
595 600 605

act tcc tat gaa aat caa act ctc ata aat cta ttg tca gtg aga  
1931

Thr Ser Tyr Glu Asn Gln Thr Leu Ile Asn Leu Leu Ser Val Arg  
610 615 620

tgaaggttct ttgtgccaga ttgaatgatg tttgttaaaa ctgaactagt tgggaagttt  
1991

tttactttgt gttcaaagtt tatttcccaa aatgttcaaa aggtcctaga tttcaaaaag  
2051

acatcctgta attattttta gtgaagttgt aacactgaag tacaatttgt attatgatgt  
2111

gaaaacttta tttttgcttt caaaatgtac ataagataag attctaaac  
2160

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Leu Ala Ser Tyr Tyr Val Met Pro Leu Val Glu Leu Pro Thr Ile Lys  
35 40 45

Asn Tyr Met Gln Ser Lys Ile Val Thr Asn Ser Ser Asp Val Leu Asn  
50 55 60

Ser Tyr Asn Lys Val Leu Val Thr Asn His Gly Asn Ile Phe Ser Tyr  
65 70 75 80

Phe Arg Ile Asn Ile Pro Phe Pro Cys Glu Cys Ile Gly Gly Glu Phe  
85 90 95

Leu Gly His Val Phe Glu Tyr Thr Thr Lys Lys Gly Asp Thr Tyr Asp  
100 105 110

Leu Ile Ala Asn Asn Tyr Tyr Val Ser Leu Thr Ser Val Glu Leu Leu  
115 120 125

Lys Lys Phe Asn Ser Tyr Asp Pro Asn His Ile Pro Ala Lys Ala Lys  
130 135 140

Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Ile Ser Lys  
145 150 155 160

Asp Tyr Gly Leu Phe Val Thr Tyr Pro Leu Arg Ser Thr Asp Ser Leu  
165 170 175

Glu Lys Ile Ala Asn Glu Ser Lys Leu Asp Glu Gly Leu Ile Gln Asn  
180 185 190

Phe Asn Pro Asp Val Asn Phe Ser Arg Gly Ser Gly Ile Val Phe Ile  
195 200 205

Pro Gly Arg Asp Lys Asn Gly Glu Tyr Val Pro Leu Tyr Pro Lys Thr  
210 215 220

Gly Val Gly Lys Gly Val Ala Ile Gly Ile Ser Ile Ala Gly Val Phe  
225 230 235 240

Ala Val Leu Leu Phe Val Ile Cys Ile Tyr Val Lys Tyr Phe Gln Lys  
245 250 255

Lys Glu Glu Glu Lys Thr Ile Leu Pro Gln Val Ser Lys Ala Leu Ser  
260 265 270

Thr Gln Asp Gly Asn Ala Ser Ser Ser Gly Glu Tyr Glu Thr Ser Gly  
275 280 285

Ser Ser Gly His Gly Thr Gly Ser Ala Ala Gly Leu Thr Gly Ile Met  
290 295 300

Val Ala Lys Ser Thr Glu Phe Ser Tyr Gln Glu Leu Ala Lys Ala Thr  
305 310 315 320

Asp Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe Gly Ala  
325 330 335

Val Tyr Tyr Ala Glu Leu Arg Gly Glu Lys Thr Ala Ile Lys Lys Met  
340 345 350

Asn Val Gln Ala Ser Ser Glu Phe Leu Cys Glu Leu Lys Val Leu Thr  
355 360 365

His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys Val Glu  
370 375 380

Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn Leu Gly  
385 390 395 400

Gln Tyr Leu His Gly Lys Asp Lys Glu Pro Leu Pro Trp Ser Ser Arg  
405 410 415

Val Gln Ile Ala Leu Asp Ser Ala Arg Gly Leu Glu Tyr Ile His Glu  
420 425 430

His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala Asn Ile  
435 440 445

Leu Ile Asp Lys Asn Leu Arg Gly Lys Val Ala Asp Phe Gly Leu Thr  
450 455 460

Lys Leu Ile Glu Val Gly Asn Ser Thr Leu His Thr Arg Leu Val Gly  
465 470 475 480

Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp Val Ser  
485 490 495

Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Tyr Glu Leu Ile  
500 505 510

Ser Ala Lys Asn Ala Val Leu Lys Thr Gly Glu Glu Ser Val Ala Glu  
515 520 525

Ser Lys Gly Leu Val Ala Leu Phe Glu Lys Ala Leu Asn Gln Ile Asp  
530 535 540

Pro Ser Glu Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Lys Glu Asn  
545 550 555 560

Tyr Pro Ile Asp Ser Val Leu Lys Met Ala Gln Leu Gly Arg Ala Cys  
565 570 575

Thr Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val Val  
580 585 590

Asp Leu Met Thr Leu Ser Ser Pro Phe Glu Asp Cys Asp Asp Asp Thr  
595 600 605

Ser Tyr Glu Asn Gln Thr Leu Ile Asn Leu Leu Ser Val Arg  
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120

ctctttccct tattgattca atg aaa ctc aaa aat ggg tta ctg ctg ttc ttt  
173

Met Lys Leu Lys Asn Gly Leu Leu Leu Phe Phe  
1 5 10

atg ttt ctg gat tgt att ttt ttc aaa gtg gaa tcc aag tgt gta ata  
221

Met Phe Leu Asp Cys Ile Phe Phe Lys Val Glu Ser Lys Cys Val Ile  
15 20 25

ggg tgt gat ata gct tta gct tcc tac tat gta atg cct tta gtt caa  
269

Gly Cys Asp Ile Ala Leu Ala Ser Tyr Tyr Val Met Pro Leu Val Gln  
 30 35 40  
 ctc tcc aat ata aca acc ttt atg caa tca aag ctt gtt acc aat tct  
 317  
 Leu Ser Asn Ile Thr Thr Phe Met Gln Ser Lys Leu Val Thr Asn Ser  
 45 50 55  
 ttt gag gtt ata gta agg tac aac aga gac att gtg ttc agt aat gat  
 365  
 Phe Glu Val Ile Val Arg Tyr Asn Arg Asp Ile Val Phe Ser Asn Asp  
 60 65 70 75  
 aat ctt ttt tcc tat ttt aga gtc aac att cca ttc cca tgt gaa tgt  
 413  
 Asn Leu Phe Ser Tyr Phe Arg Val Asn Ile Pro Phe Pro Cys Glu Cys  
 80 85 90  
 att gga ggt gaa ttt ctt ggg cat gtg ttt gaa tac act gca aat gaa  
 461  
 Ile Gly Gly Glu Phe Leu Gly His Val Phe Glu Tyr Thr Ala Asn Glu  
 95 100 105  
 ggc gat act tat gat tta att gca aat acc tat tat gca agc tta aca  
 509  
 Gly Asp Thr Tyr Asp Leu Ile Ala Asn Thr Tyr Tyr Ala Ser Leu Thr  
 110 115 120  
 act gtt gag gtt ttg aaa aag tac aac agc tat gat cca aat cat ata  
 557  
 Thr Val Glu Val Leu Lys Lys Tyr Asn Ser Tyr Asp Pro Asn His Ile  
 125 130 135  
 cct gtc aaa gct aag gtt aat gtc act gtt aat tgt tct tgt ggg aac  
 605  
 Pro Val Lys Ala Lys Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn  
 140 145 150 155  
 agc cag att tca aaa gac tat ggg cta ttt atc acc tat cca ctt agg  
 653  
 Ser Gln Ile Ser Lys Asp Tyr Gly Leu Phe Ile Thr Tyr Pro Leu Arg  
 160 165 170  
 cct agg gat act ctt gag aag att gca aga cat tct aat ctt gat gaa  
 701  
 Pro Arg Asp Thr Leu Glu Lys Ile Ala Arg His Ser Asn Leu Asp Glu  
 175 180 185  
 gga gta ata caa agt tac aat ttg ggt gtc aat ttc agc aaa ggc agc  
 749  
 Gly Val Ile Gln Ser Tyr Asn Leu Gly Val Asn Phe Ser Lys Gly Ser  
 190 195 200  
 ggg gta gtg ttc ttt ccc gga aga gat aaa aat gga gaa tat gtt cct  
 797  
 Gly Val Val Phe Phe Pro Gly Arg Asp Lys Asn Gly Glu Tyr Val Pro  
 205 210 215



tta tat cct aga aca ggt ctt ggt aag ggt gca gct gct ggt ata tct  
 845  
 Leu Tyr Pro Arg Thr Gly Leu Gly Lys Gly Ala Ala Ala Gly Ile Ser  
 220 225 230 235

ata gct gga ata ttt gcg ctt ctg tta ttt gtt atc tgc ata tat atc  
 893  
 Ile Ala Gly Ile Phe Ala Leu Leu Leu Phe Val Ile Cys Ile Tyr Ile  
 240 245 250

aaa tac ttc caa aag aag gaa gaa gag aaa act aaa ctg cca caa gtt  
 941  
 Lys Tyr Phe Gln Lys Lys Glu Glu Glu Lys Thr Lys Leu Pro Gln Val  
 255 260 265

tct acg gcg ctt tca gct caa gat gcc tcg ggt agt gga gag tac gaa  
 989  
 Ser Thr Ala Leu Ser Ala Gln Asp Ala Ser Gly Ser Gly Glu Tyr Glu  
 270 275 280

act tcg gga tcc agt ggg cat ggt acc ggt agt act gct ggc ctt aca  
 1037  
 Thr Ser Gly Ser Ser Gly His Gly Thr Gly Ser Thr Ala Gly Leu Thr  
 285 290 295

gga att atg gtg gca aag tca act gag ttt tca tat caa gaa cta gcc  
 1085  
 Gly Ile Met Val Ala Lys Ser Thr Glu Phe Ser Tyr Gln Glu Leu Ala  
 300 305 310 315

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 1133  
 Lys Ala Thr Asn Asn Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly  
 320 325 330

ttt gga gct gtc tat tat gca gta ctc aga ggc gag aaa aca gca att  
 1181  
 Phe Gly Ala Val Tyr Tyr Ala Val Leu Arg Gly Glu Lys Thr Ala Ile  
 335 340 345

aag aag atg gat gta caa gcg tca aca gaa ttc ctt tgc gag ttg caa  
 1229  
 Lys Lys Met Asp Val Gln Ala Ser Thr Glu Phe Leu Cys Glu Leu Gln  
 350 355 360

gtc tta aca cat gtt cat cac ttg aat ctg gtg agg ttg att gga tat  
 1277  
 Val Leu Thr His Val His His Leu Asn Leu Val Arg Leu Ile Gly Tyr  
 365 370 375

tgt gtt gag gga tca ctt ttc ctt gta tat gaa cat att gac aat gga  
 1325  
 Cys Val Glu Gly Ser Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly  
 380 385 390 395

aac ttg ggt caa tat ttg cac ggt ata gat aaa gcg cca tta cca tgg  
1373

Asn Leu Gly Gln Tyr Leu His Gly Ile Asp Lys Ala Pro Leu Pro Trp  
400 405 410

tca agt agg gtg caa att gct cta gat tcc gca aga ggc ctt gaa tac  
1421

Ser Ser Arg Val Gln Ile Ala Leu Asp Ser Ala Arg Gly Leu Glu Tyr  
415 420 425

att cat gaa cac act gta cct gtg tat atc cat cgt gat gta aaa tca  
1469

Ile His Glu His Thr Val Pro Val Tyr Ile His Arg Asp Val Lys Ser  
430 435 440

gcg aat ata tta ata gac aaa aac ttg cac gga aag gtt gca gat ttt  
1517

Ala Asn Ile Leu Ile Asp Lys Asn Leu His Gly Lys Val Ala Asp Phe  
445 450 455

ggc ttg acc aaa ctt att gaa gtt gga aac tcc aca ctt cac act cgt  
1565

Gly Leu Thr Lys Leu Ile Glu Val Gly Asn Ser Thr Leu His Thr Arg  
460 465 470 475

cta gtg gga aca ttt gga tac atg cca cca gaa tat gct caa tat ggc  
1613

Leu Val Gly Thr Phe Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly  
480 485 490

gat gtt tct cca aaa ata gat gta tat gct ttt gga gtt gtt ctt tat  
1661

Asp Val Ser Pro Lys Ile Asp Val Tyr Ala Phe Gly Val Val Leu Tyr  
495 500 505

gag ctt att tct gca aag aat gct att ctg aag aca ggt gaa tct gct  
1709

Glu Leu Ile Ser Ala Lys Asn Ala Ile Leu Lys Thr Gly Glu Ser Ala  
510 515 520

gtc gaa tca aag ggt ctt gta gca ttg ttt gaa gaa gca ctt aat cag  
1757

Val Glu Ser Lys Gly Leu Val Ala Leu Phe Glu Glu Ala Leu Asn Gln  
525 530 535

atc gat cct tta gaa gct ctt cgc aaa ttg gtg gat cct agg ctt aaa  
1805

Ile Asp Pro Leu Glu Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Lys  
540 545 550 555

gaa aac tat cca att gat tct gtt tta aag atg gct caa ctt ggg aga  
1853

Glu Asn Tyr Pro Ile Asp Ser Val Leu Lys Met Ala Gln Leu Gly Arg  
560 565 570

gca tgt aca aga gac aat cca cta cta cgc cca agt atg aga tct tta  
1901

Ala Cys Thr Arg Asp Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu  
575 580 585

gtc gtt gct ctt atg aca ctc tta tca cat act gat gat gat gac act  
1949

Val Val Ala Leu Met Thr Leu Leu Ser His Thr Asp Asp Asp Asp Thr  
590 595 600

ttc tat gaa aat caa tct ctc aca aat cta tta tca gtg aga  
1991

Phe Tyr Glu Asn Gln Ser Leu Thr Asn Leu Leu Ser Val Arg  
605 610 615

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2051

aatgtttgta ctctgaacat aatattgagg ttaggaagtt ttgatcttgt gttcaaattt  
2111

tatttcccaa aatagtcaaa aagtcctaga tccaaagaag acatcctgta attattttta  
2171

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2217

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<400> 54

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Leu Ala Ser Tyr Tyr Val Met Pro Leu Val Gln Leu Ser Asn Ile Thr  
35 40 45

Thr Phe Met Gln Ser Lys Leu Val Thr Asn Ser Phe Glu Val Ile Val  
50 55 60

Arg Tyr Asn Arg Asp Ile Val Phe Ser Asn Asp Asn Leu Phe Ser Tyr  
65 70 75 80

Phe Arg Val Asn Ile Pro Phe Pro Cys Glu Cys Ile Gly Gly Glu Phe  
85 90 95

Leu Gly His Val Phe Glu Tyr Thr Ala Asn Glu Gly Asp Thr Tyr Asp  
100 105 110

Leu Ile Ala Asn Thr Tyr Tyr Ala Ser Leu Thr Thr Val Glu Val Leu  
115 120 125

Lys Lys Tyr Asn Ser Tyr Asp Pro Asn His Ile Pro Val Lys Ala Lys  
130 135 140

Val Asn Val Thr Val Asn Cys Ser Cys Gly Asn Ser Gln Ile Ser Lys  
145 150 155 160

Asp Tyr Gly Leu Phe Ile Thr Tyr Pro Leu Arg Pro Arg Asp Thr Leu  
165 170 175

Glu Lys Ile Ala Arg His Ser Asn Leu Asp Glu Gly Val Ile Gln Ser  
180 185 190

Tyr Asn Leu Gly Val Asn Phe Ser Lys Gly Ser Gly Val Val Phe Phe  
195 200 205

Pro Gly Arg Asp Lys Asn Gly Glu Tyr Val Pro Leu Tyr Pro Arg Thr  
210 215 220

Gly Leu Gly Lys Gly Ala Ala Ala Gly Ile Ser Ile Ala Gly Ile Phe  
225 230 235 240

Ala Leu Leu Leu Phe Val Ile Cys Ile Tyr Ile Lys Tyr Phe Gln Lys  
245 250 255

Lys Glu Glu Glu Lys Thr Lys Leu Pro Gln Val Ser Thr Ala Leu Ser  
260 265 270

Ala Gln Asp Ala Ser Gly Ser Gly Glu Tyr Glu Thr Ser Gly Ser Ser  
275 280 285

Gly His Gly Thr Gly Ser Thr Ala Gly Leu Thr Gly Ile Met Val Ala  
290 295 300

Lys Ser Thr Glu Phe Ser Tyr Gln Glu Leu Ala Lys Ala Thr Asn Asn  
305 310 315 320

Phe Ser Leu Asp Asn Lys Ile Gly Gln Gly Gly Phe Gly Ala Val Tyr

	325		330		335
Tyr Ala Val	Leu Arg Gly Glu Lys Thr	Ala Ile Lys Lys Met Asp Val			
	340	345	350		
Gln Ala Ser Thr Glu Phe Leu Cys Glu Leu Gln Val Leu Thr His Val					
	355	360	365		
His His Leu Asn Leu Val Arg Leu Ile Gly Tyr Cys Val Glu Gly Ser					
	370	375	380		
Leu Phe Leu Val Tyr Glu His Ile Asp Asn Gly Asn Leu Gly Gln Tyr					
385	390	395	400		
Leu His Gly Ile Asp Lys Ala Pro Leu Pro Trp Ser Ser Arg Val Gln					
	405	410	415		
Ile Ala Leu Asp Ser Ala Arg Gly Leu Glu Tyr Ile His Glu His Thr					
	420	425	430		
Val Pro Val Tyr Ile His Arg Asp Val Lys Ser Ala Asn Ile Leu Ile					
	435	440	445		
Asp Lys Asn Leu His Gly Lys Val Ala Asp Phe Gly Leu Thr Lys Leu					
	450	455	460		
Ile Glu Val Gly Asn Ser Thr Leu His Thr Arg Leu Val Gly Thr Phe					
465	470	475	480		
Gly Tyr Met Pro Pro Glu Tyr Ala Gln Tyr Gly Asp Val Ser Pro Lys					
	485	490	495		
Ile Asp Val Tyr Ala Phe Gly Val Val Leu Tyr Glu Leu Ile Ser Ala					
	500	505	510		
Lys Asn Ala Ile Leu Lys Thr Gly Glu Ser Ala Val Glu Ser Lys Gly					
	515	520	525		
Leu Val Ala Leu Phe Glu Glu Ala Leu Asn Gln Ile Asp Pro Leu Glu					
530	535	540			
Ala Leu Arg Lys Leu Val Asp Pro Arg Leu Lys Glu Asn Tyr Pro Ile					
545	550	555	560		

Asp Ser Val Leu Lys Met Ala Gln Leu Gly Arg Ala Cys Thr Arg Asp  
565 570 575

Asn Pro Leu Leu Arg Pro Ser Met Arg Ser Leu Val Val Ala Leu Met  
580 585 590

Thr Leu Leu Ser His Thr Asp Asp Asp Asp Thr Phe Tyr Glu Asn Gln  
595 600 605

Ser Leu Thr Asn Leu Leu Ser Val Arg  
610 615